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Title: Overview of Proposed Summer Project

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Intended for: Discussion with summer student about proposed project prior to commencement of work.

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Overview of Proposed Summer Project

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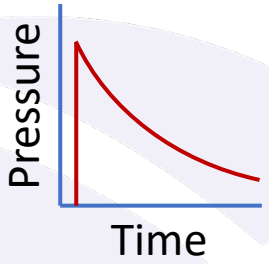
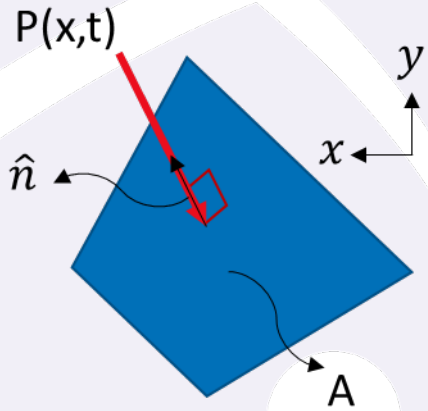
Abstract

The following are visual aids developed to assist in initial discussion with an intern about their proposed Summer 2021 project.

Motivation

- Pressure waves can have significant effect on flight objects.
  - Characteristic behavior:
    - short rise time
    - exponential decay
- Suddenly passing from one pressure state to another creates a shock front that acts on the object in question.
  - Example: Turbulence
- Important to understand the pressure distribution on an object
  - Complex mapping processes exist at LANL – (Not user friendly)

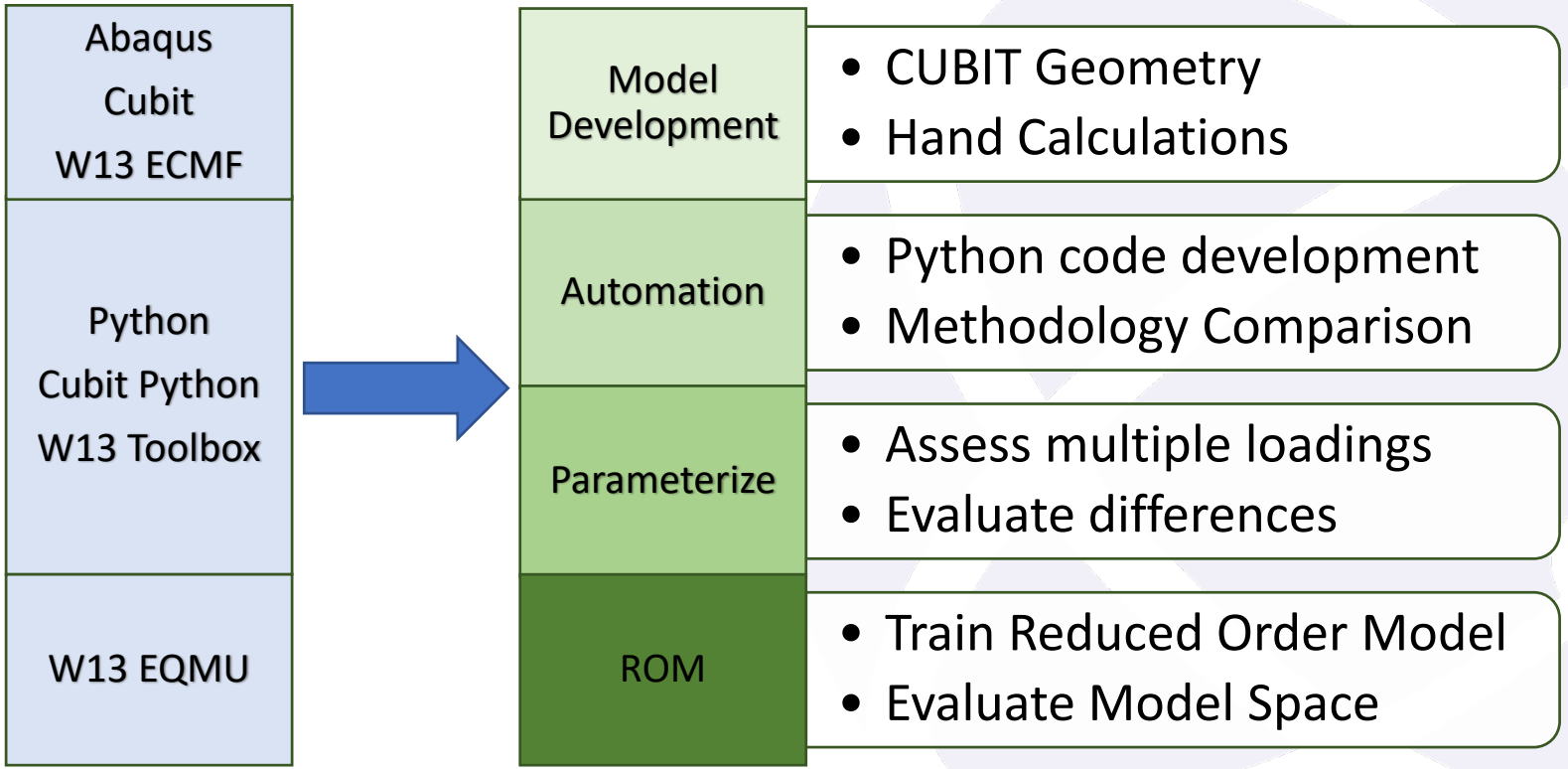




Project Goal

Develop a user friendly code to assess pressure load on a geometry of interest to understand the rigid body effects, and compare to more complex approaches

Proposed Project Workflow: 13 week project



Existing Tools

- Abaqus → Finite Element Model Software
- CUBIT → Geometry and mesh generation software
- W13 ECMF → Automated engineering simulation management tool
- Python → Programming language for quick system integration
- CUBIT Python → Incorporation of Python with CUBIT
- W13 Toolbox → 'Warehouse' of in-house code
  - Mapping Scripts → spatial and temporal interpolation
  - Metric Evaluation → ISO18571 Standards
- W13 EQMU Toolset → Tools to assess uncertainty in model parameters